Cost-Effectiveness Under AB 32

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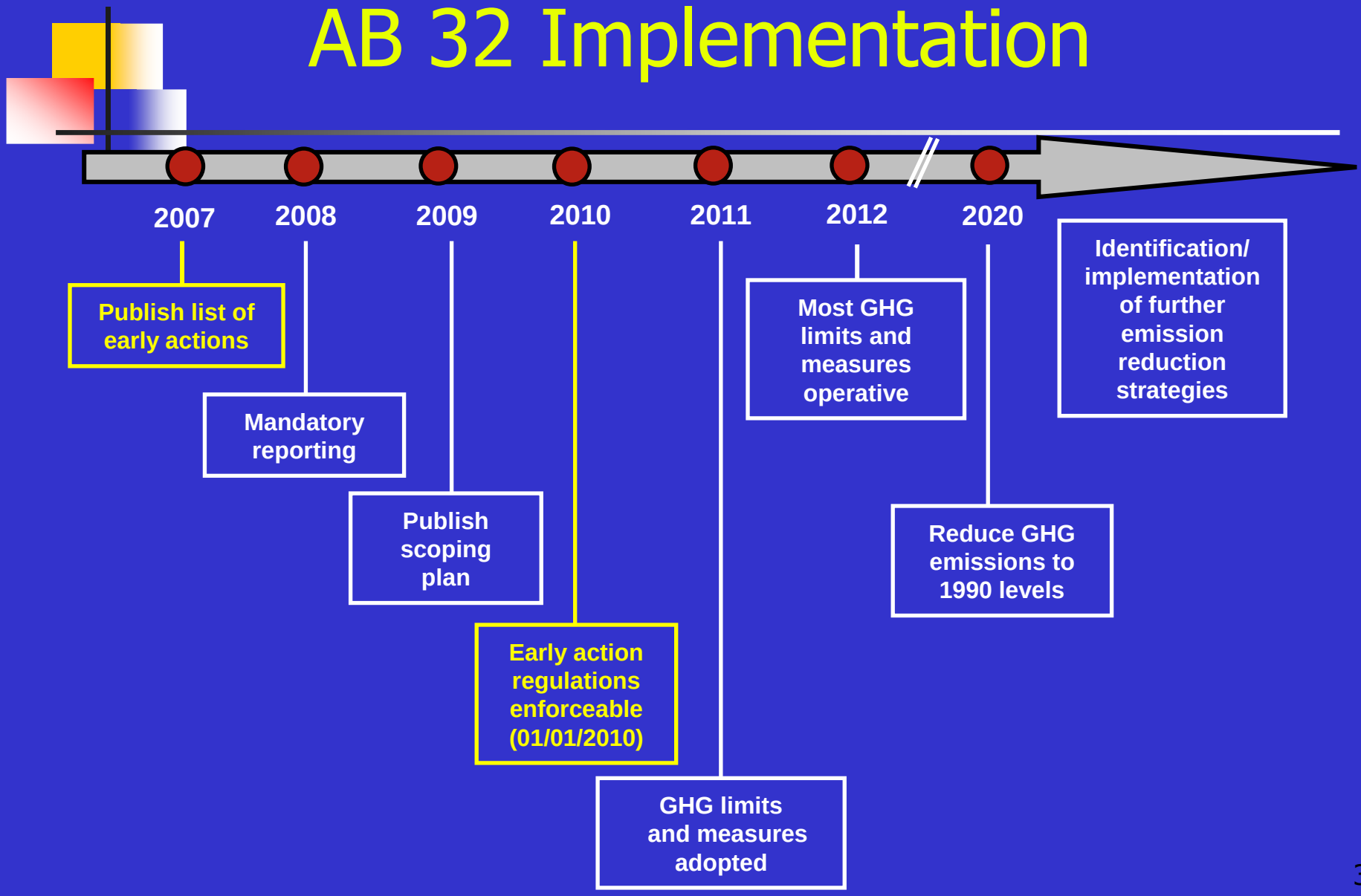
Cost-Effectiveness Under AB 32

- AB 32 Overview
- How ARB calculates cost-effectiveness for criteria pollutants
- Some cost-effectiveness approaches for AB 32
- Abatement cost curve examples

AB 32 Implementation



AB 32 Cost-Effectiveness

- AB 32 Requirements
  - Scoping Plan to achieve cost-effective reductions
  - Consider cost-effective regulations
- Definition in AB 32
  - Cost per unit (ton) of reduced GHG emissions adjusted for global warming potential

Input Requested on Aspects of Cost-Effectiveness

- Technical approach to determine costs
- Allocating costs for measures that result in co-benefits
- Policy considerations in determining cost-effectiveness

Technical Approach for Cost-Effectiveness

- ARB's Method to Calculate Cost-Effectiveness for Criteria Pollutants
- Evaluating Co-Benefits

Calculating Cost-Effectiveness

- AB 32 Definition
  - C-E = Dollars per ton GHG reduced
- ARB method of criteria pollutants
  - C-E = Annualized capital cost
    - Add operation and maintenance (O&M)
    - Subtract annual cost savings
    - Divide by annual emissions (in tons)

Accounting for Pollutant Co-Benefits

- ARB C-E = Annualized Capital Cost
  - Add operation and maintenance (O&M)
  - Subtract annual cost savings
  - Subtract Value of Avoided Criteria Emissions
  - Divide by annual emissions (in tons)

Value of Avoided Criteria Pollutant Emissions

- $12,500/ton Reactive Organic Gases (ROGs)
- $20,800/ton Nitrogen Oxides (NOx)
- $20,000/ton Particulate Matter (PM10)

Reference: "Proposed State Strategy for California's 2007 SIP" Appendix E, May 7, 2007. The proposed strategy was adopted by the ARB on September 27, 2007.

Cost-Effectiveness Policy Considerations

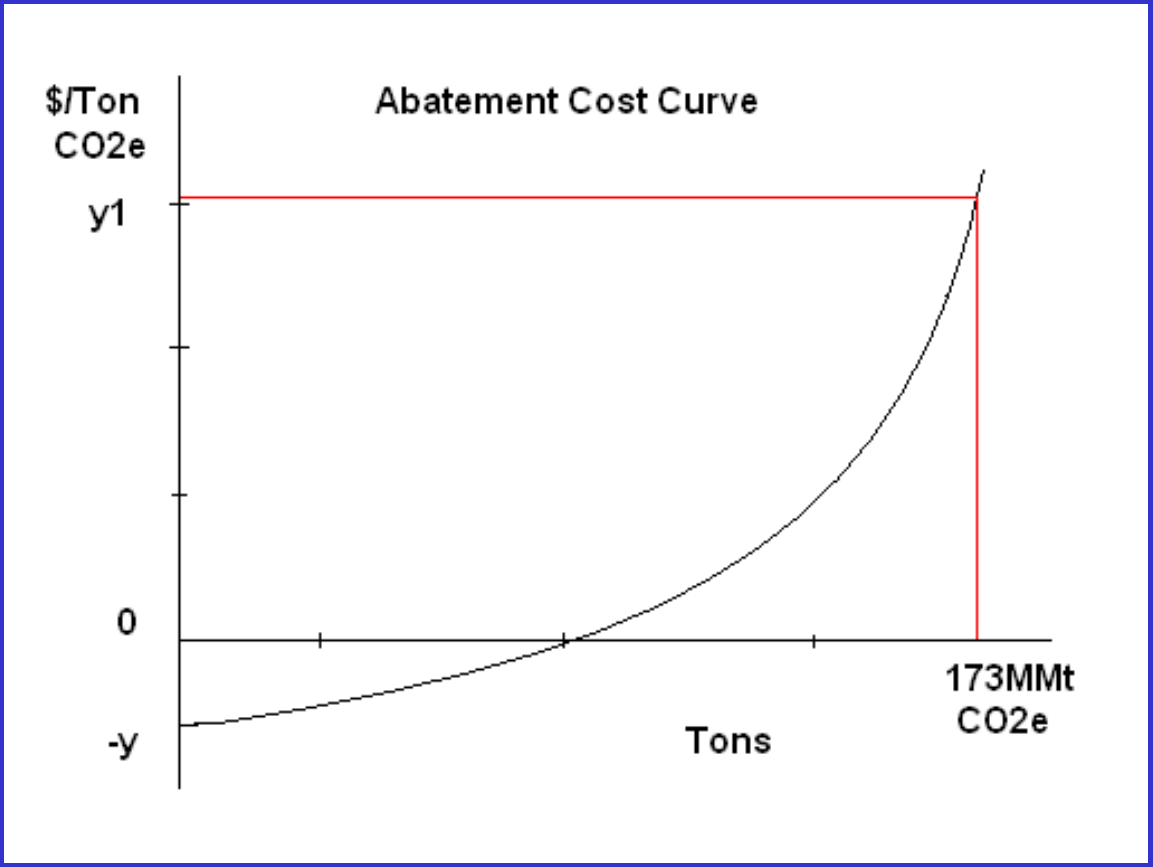
- What is a cost-effectiveness measure?
- Staff's recommended approach
- Three alternative approaches

Approach #1: Cost of a Bundle of Strategies

- Recommended Approach for Today's Discussion
  - Assess range of measures' cost-effectiveness
  - Rank measures according to relative cost-effectiveness
  - Select most cost effective measures to meet bundle of strategies until target is reached

- Advantage: Allows for flexibility to taylor program to meet AB 32 requirements.

Approach #1:
Cost of a Bundle of Strategies

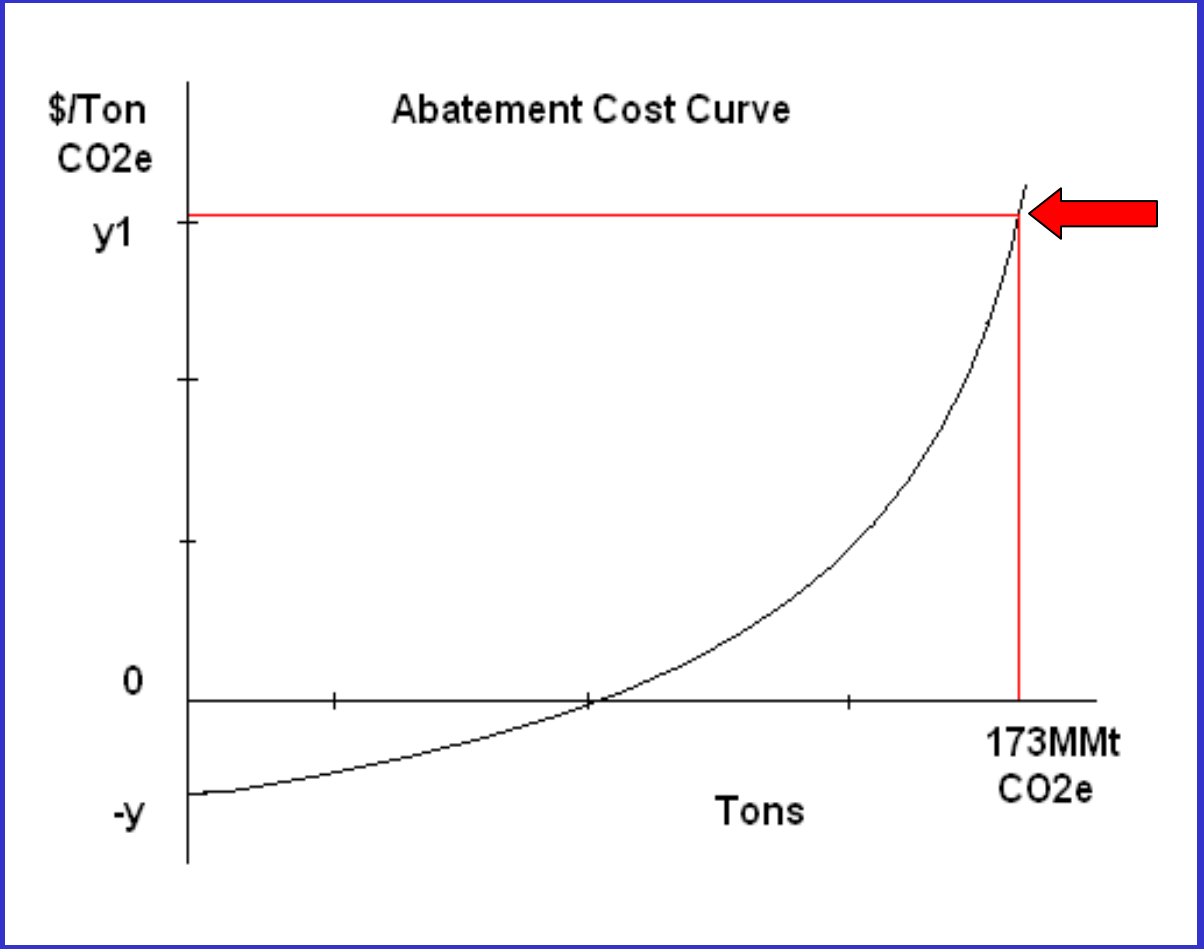


Approach #2: Cost of the Last Ton Reduced

- Assess range of measures' cost-effectiveness
- Rank measures according to cost-effectiveness
- Select the cost-effectiveness of last ton as the threshold

- Advantage: ARB can select one value at the outset

Approach #2:
Cost of the Last Ton Reduced



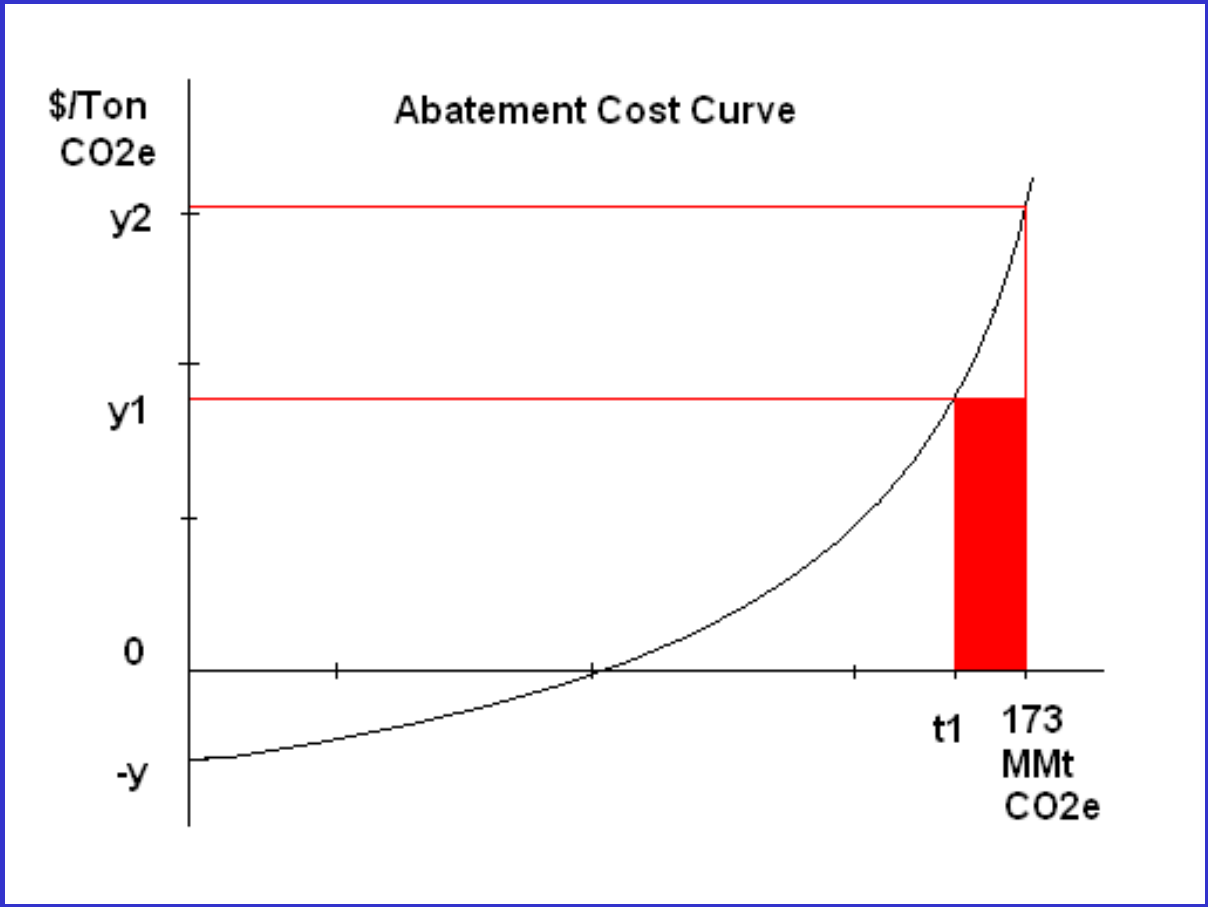
Approach #3: GHG Market Price as Proxy

- Select an existing carbon market (e.g., EU ETS) as representative cost-effectiveness threshold for CA
- Establish a price based on existing market price
- Use price as proxy for cost-effectiveness

Issue: EU ETS Price As A Proxy

- Direct comparisons are difficult
  - Different market profiles, regulatory policies, allocation schemes
  - California has yet to develop a market scheme, and potential scope is not yet known

Approach #3:
GHG Market Price as Proxy



Approach #4: Net Zero Cost

- Adopt only measures with net zero or negative cost (savings)
  - May not be possible to achieve 2020 target with measures that are limited to cost savings

Abatement Costs -- Examples

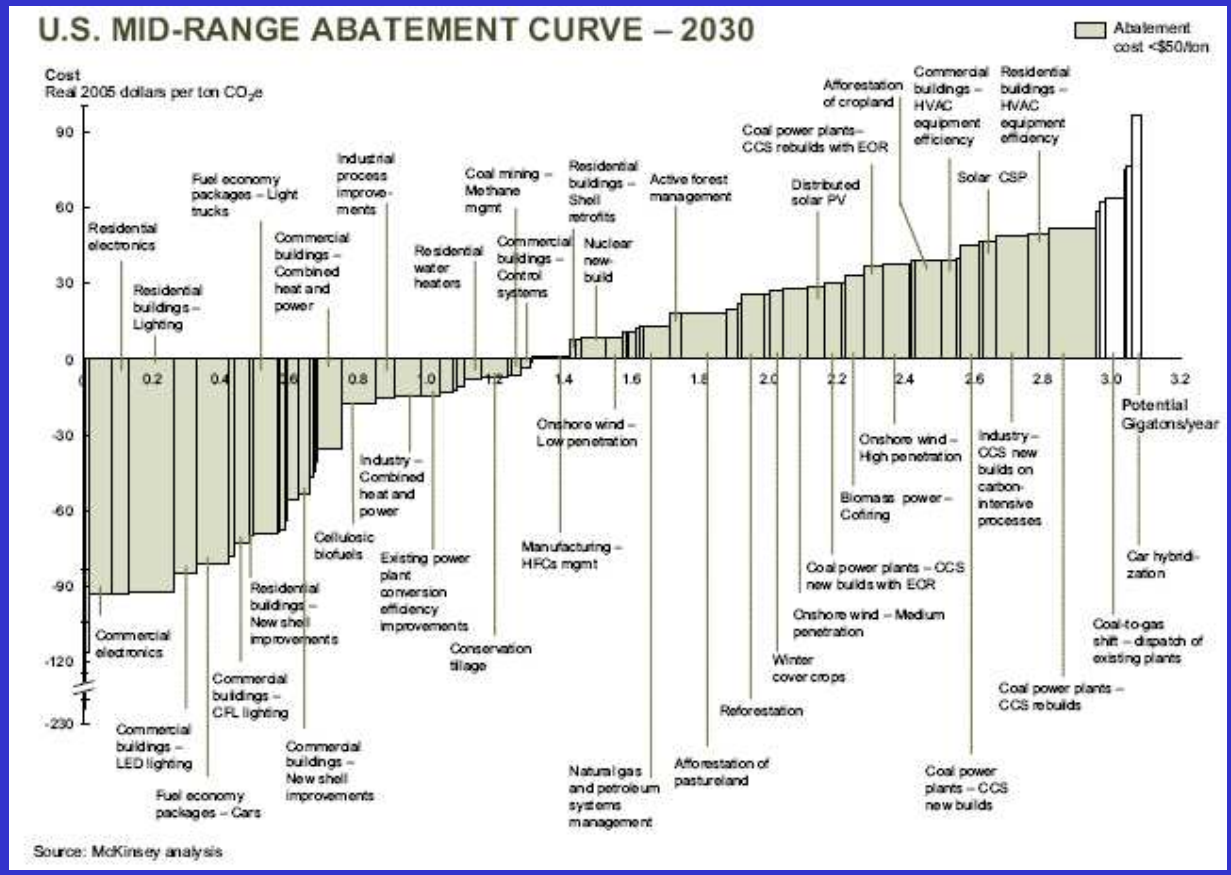
- Range for selected states, including California
- McKinsey & Company
- Intergovernmental Panel on Climate Change (IPCC)

Cost-Effectiveness Range ($/MMt CO_2e)

Exhibit 3: Cost-effectiveness Range for Selected States, United States, Global - 2020

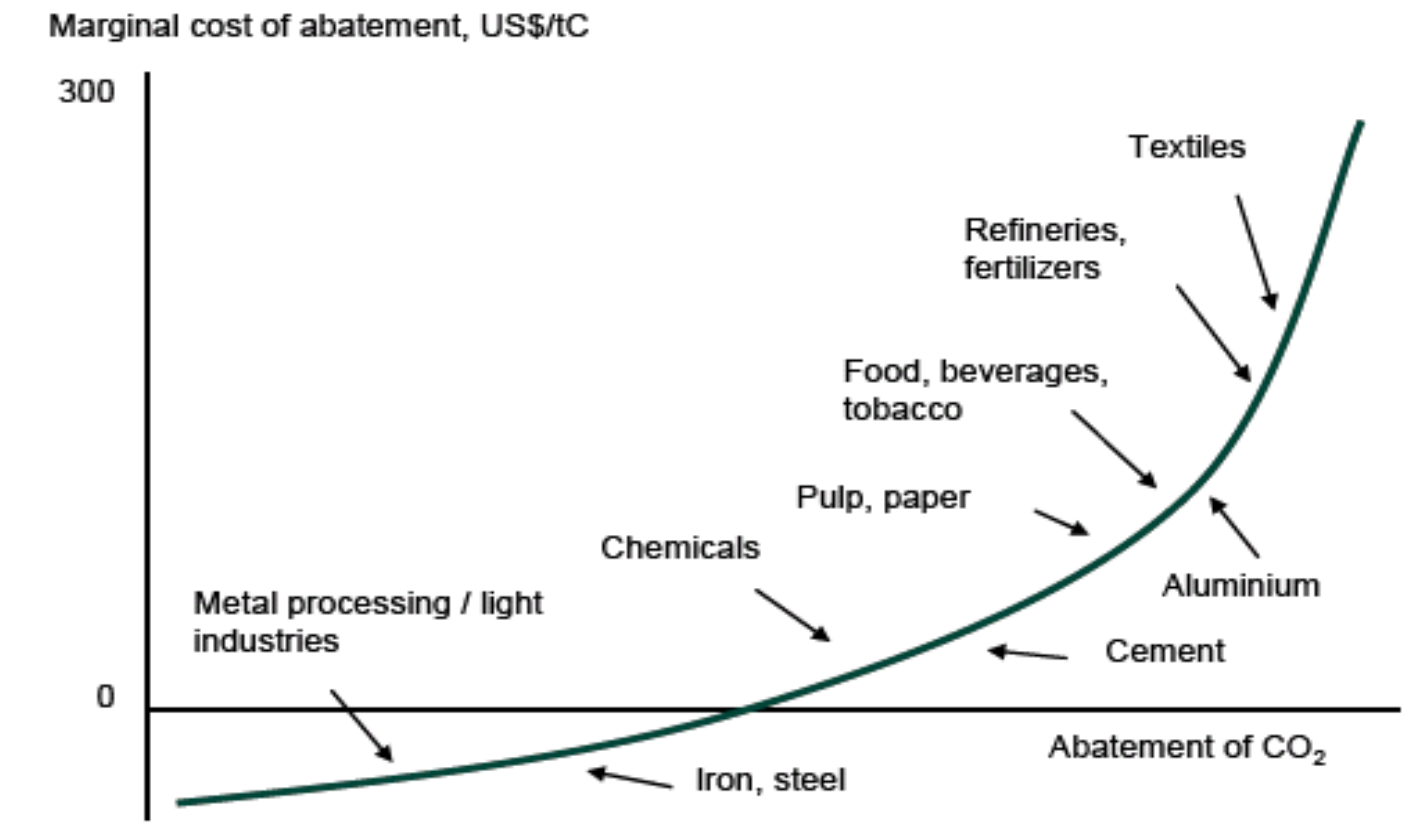
State	Cost-effectiveness Range $/ton CO2eq	Tons Reduced MMtCO2e/yr
California (CAT[1], CEC[2])	- 528 to 615	138
Arizona[3]	- 90 to 65	69
New Mexico[4]	- 120 to105	35
United States (2030)[5]	-93 to 91	3,000
Global (Total)[6]	-225 to 91	26,000

U.S. Abatement Cost Curve*



*McKinsey (2005 US $/T CO2e)

Marginal Cost of Abatement for Selected Industries



Source: Intergovernmental Panel on Climate Change (2001), vol.IV, ch.4.

Summary & Next Steps

- Overview of Technical and Policy Considerations of Cost-Effectiveness
- Staff evaluating information on CAT recommended measures
- Staff cost-effectiveness recommendations in the June draft Scoping Plan

Questions & Comments

- Send Questions & Comments via e-mail:

  ccplan@arb.ca.gov